

How to Transfer GIS Data so the Files Don't Corrupt

GIS FILE FORMATS

There are several file formats available for you to work with in ArcGIS. NOTE: It is recommended that you copy or move GIS datasets using **ArcCatalog** to make sure you copy all related files.

Shapefiles

An ESRI shapefile is “a vector data storage format for storing the location, shape, and attributes of geographic features”. It is stored in a set of related files and contains one feature class.” The geometry is stored in the main **.shp** file as a set of vector coordinates making up shapes (either point, line, or area features). There is no topology (i.e. relationships between connected features or shared borders), so shapefiles have a faster drawing speed, greater edit ability, lower file size, and are easier to read/write than other data sources. Attributes are held in a dBase format file (**.dbf**) in which each attribute record has a one-to-one relationship with the associated shape record. An index file (**.shx**) stores each record as the offset of the corresponding main file record from the beginning of the main file.

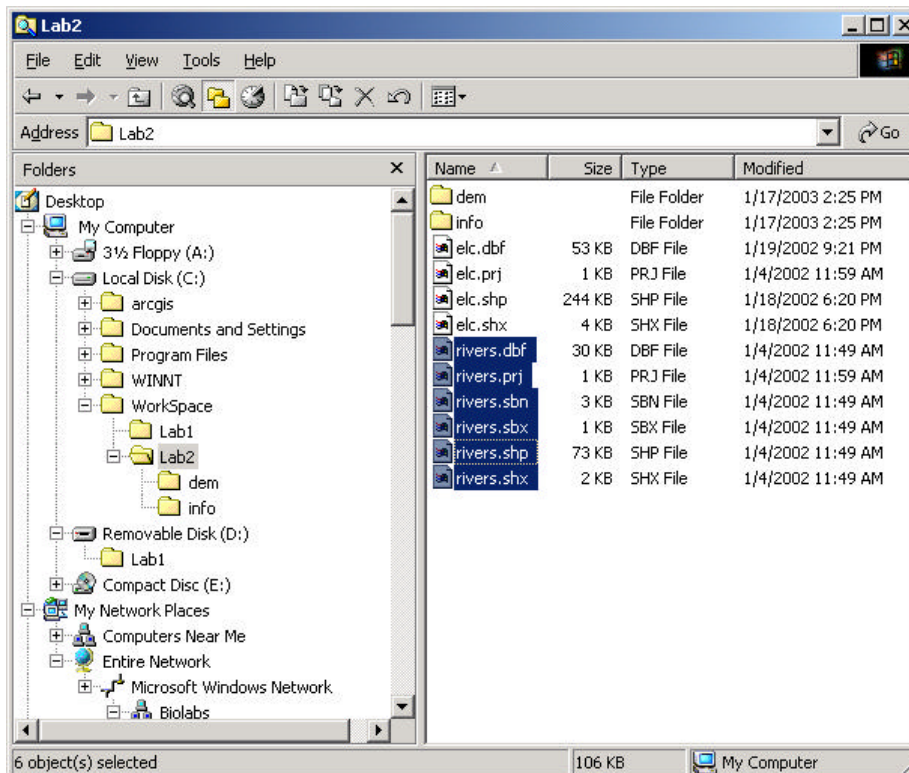
The naming conventions for shapefiles require that all associated files have the same prefix.

Required files:

- Main file (stores feature geometry): rivers.shp
- Index file (stores file lookup index): rivers.shx
- dBase table (stores attributes): rivers.dbf

Additional files:

- Projections definition file: rivers.prj
- Spatial index for read-write shapefiles: rivers.sbn
- Spatial index for read-write shapefiles: rivers.sbx



NOTE: Your data may be projected in some coordinate system; however ArcGIS requires the **.prj** file to define what system is used to facilitate geoprocessing, reprojecting, and other operations.

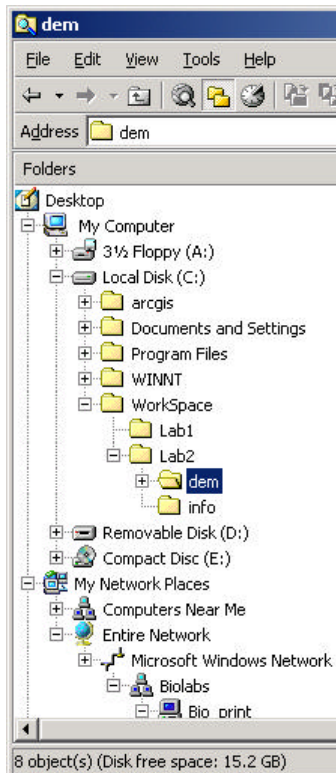
When working with shapefiles, remember to copy all associated files to your working directory so that ArcGIS may read them properly! More info can be found in the ArcGIS Desktop Help or at http://arconline.esri.com/arconline/whitepapers/ao/_shapefile.pdf

Coverages

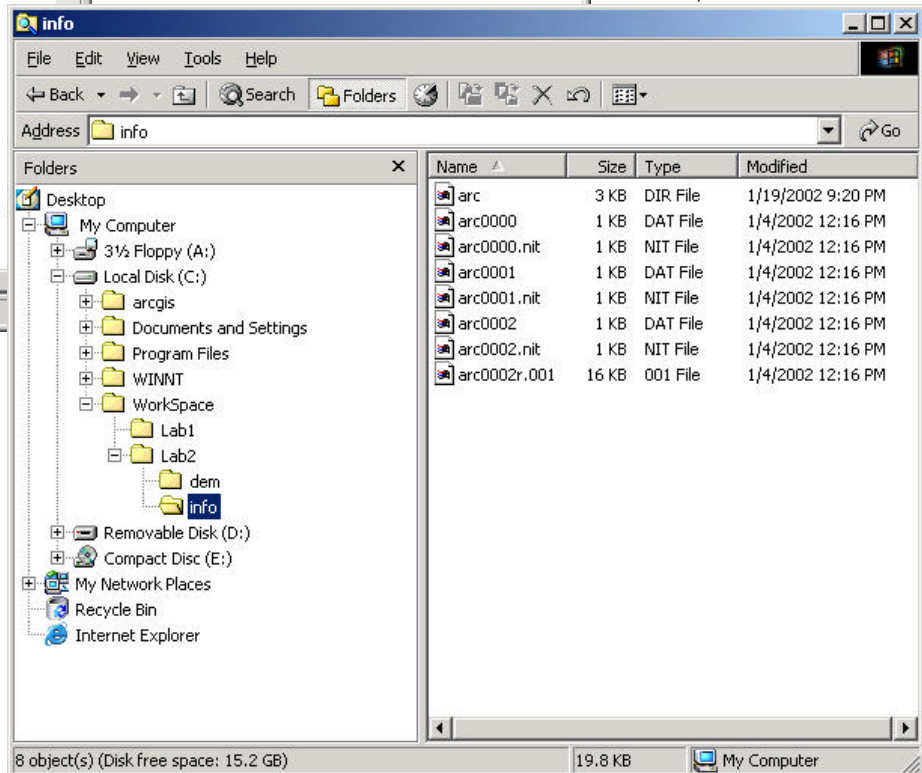
A coverage is a file-based data storage format for **vector** OR **raster** data. A single geographic theme (such as soils, streams, or land use) is represented as primary features (such as arcs, nodes, polygons, and label points OR grid cells) and secondary features (such as tics, map extent, links, and annotation) all stored in a **self-named folder**. Associated feature attribute tables describe and store attributes of the geographic features in an **info folder**. Vector and raster coverages appear to be similar in file structure (both have self-named folder and info folder) but store data in very different ways.

Topology is present in **vector** coverages; i.e. the spatial relationships between connecting or adjacent features (for example, arcs, nodes, polygons, and points). The topology of an arc includes its from- and to-nodes and its left and right polygons. Topological relationships are built from simple elements into

complex elements: points (simplest elements), arcs (sets of connected points), areas (sets of connected arcs), and routes (sets of sections, which are arcs or portions of arcs). Redundant data (coordinates) are eliminated because an arc may represent a linear feature, part of the boundary of an area feature, or both.



Name	Size	Type	Modified
dbtblnd.adf	1 KB	ADF File	1/4/2002 12:16 PM
hdr.adf	1 KB	ADF File	1/4/2002 12:16 PM
log	1 KB	File	1/4/2002 12:16 PM
metadata	6 KB	XML Docum...	1/4/2002 12:16 PM
sta.adf	1 KB	ADF File	1/4/2002 12:16 PM
vat.adf	13 KB	ADF File	1/4/2002 12:16 PM
w001001.adf	829 KB	ADF File	1/4/2002 12:16 PM
w001001x.adf	16 KB	ADF File	1/4/2002 12:16 PM



A **grid** coverage represents the world as a geographic array of equally sized square cells arranged in rows and columns. Each grid cell has an associate attribute value and is referenced by its geographic x,y location.

You must remember to use a program such as ArcCatalog when copying coverage files to ensure that the complete data structures are kept intact. Using Windows Explorer may result in the all-important info tables being overwritten!

Images

An image is a raster-based representation or description of a scene, typically produced by an optical or electronic device. Common examples include remotely sensed data (satellite data), scanned data, and photographs. An image is stored as a raster dataset of binary or integer values that represent the intensity of reflected light, heat, or other range of values on the electromagnetic spectrum.

An image may contain one or more bands. A **band** is a measure of a characteristic or quality of the features observed in a raster. Some images have a single band; others have more than one. For example, satellite imagery commonly has multiple bands representing different wavelengths of energy along the electromagnetic spectrum. A color composite image requires three different bands to be displayed as Red, Green, and Blue on the computer monitor.

Common image file formats in GIS are:

Format	Extension
Band Interleaved by Line (BIL), Band Interleaved by Pixel (BIP), OR Band Sequential (BSQ) Multiple files:	Data file—.bil, .bip, OR .bsq Header file—.hdr Colormap file—.clr Statistics file—.stx
Bitmap (BMP):	.bmp
ERDAS IMAGINE file:	.img
JPEG File Interchange Format (JFIF):	.jpg, .jpeg, .jfif
Multiresolution Seamless Image Database (MrSID)	Data file—.sid Header file—.sdw
Tag Image File Format (TIFF and GeoTIFF):	.tif, .tiff, .tff

An Auxiliary file (**.aux**) is a file that accompanies the raster in the same directory as the source dataset and stores any auxiliary information that cannot be stored in the raster file itself. Such auxiliary information may be:

- Statistical – created automatically the first time statistics are required to perform a task on your raster layer
- Pyramid file (RRD file) – stored as a pointer within the .aux if pyramids have been created for your raster dataset.
- Additional – color map, histogram/table, coordinate system, transformation, and projection information

Remember to copy all associated files to your working directory so that ArcGIS may read them properly!


USING ARCCATALOG TO COPY DATA

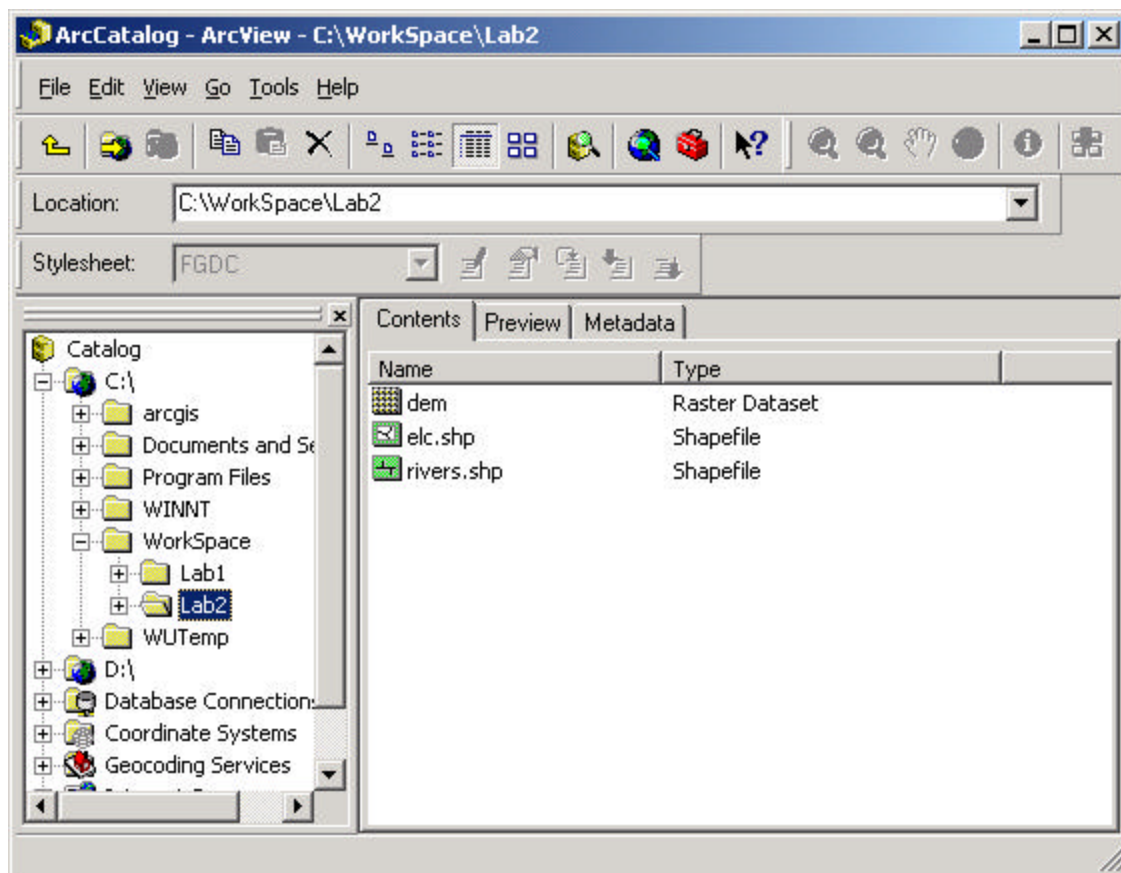
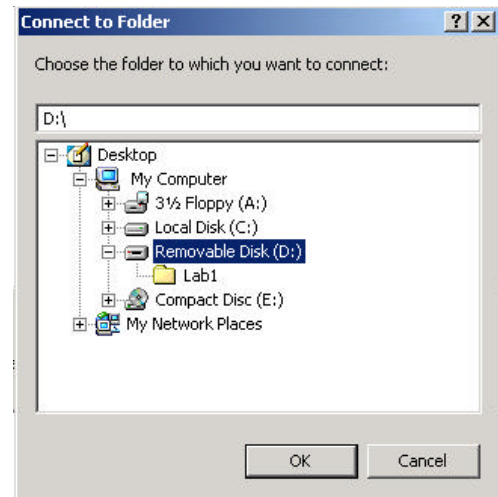
Copying and working with GIS data file formats can easily be accomplished with ESRI® ArcGIS's ArcCatalog module. This interface is designed to flawlessly copy all associated files required for the data to work properly in the GIS. It works very similar to Windows Explorer with drag and drop capability!

To access this ArcGIS module:

- Choose START → PROGRAMS → GIS → ARCGIS → ARCCATALOG

To connect to the zip disk or a folder on the network or CD:

- Click on the CONNECT TO FOLDER icon 
- Navigate to the appropriate location and click OK



NOTE: The shapefiles and coverages appear as single files in the ArcCatalog window.